

OIPE

2

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/965,825

DATE: 11/07/2001

TIME: 14:41:53

Input Set : A:\es.txt

Output Set: N:\CRF3\11072001\I965825.raw

3 <110> APPLICANT: DUSCH, Nicole
4 THOMAS, Hermann
5 THIERBACH, Georg
7 <120> TITLE OF INVENTION: PROCESS FOR THE FERMENTATIVE PREPARATION OF D-PANTOTHENOIC
ACID USING
8 CORYNEFORM BACTERIA
10 <130> FILE REFERENCE: 21354US0X
C--> 12 <140> CURRENT APPLICATION NUMBER: US/09/965,825
C--> 12 <141> CURRENT FILING DATE: 2001-10-01
12 <150> PRIOR APPLICATION NUMBER: DE 10048604.5
13 <151> PRIOR FILING DATE: 2000-09-30
15 <150> PRIOR APPLICATION NUMBER: DE 10117085.8
16 <151> PRIOR FILING DATE: 2001-04-06
18 <160> NUMBER OF SEQ ID NOS: 14
20 <170> SOFTWARE: PatentIn version 3.1
22 <210> SEQ ID NO: 1
23 <211> LENGTH: 2160
24 <212> TYPE: DNA
25 <213> ORGANISM: Corynebacterium glutamicum
27 <220> FEATURE:
28 <221> NAME/KEY: CDS
29 <222> LOCATION: (327)..(2063)
30 <223> OTHER INFORMATION:
33 <220> FEATURE:
34 <221> NAME/KEY: -35_signal
35 <222> LOCATION: (227)..(232)
36 <223> OTHER INFORMATION:
39 <220> FEATURE:
40 <221> NAME/KEY: -10_signal
41 <222> LOCATION: (256)..(261)
42 <223> OTHER INFORMATION:
45 <400> SEQUENCE: 1
46 tttagaggcga ttctgtgagg tcaactttttg tgggggtcggg gtctaaattt ggccagtttt 60
48 cgaggcgacc agacaggcgt gccccacgatg tttaaatagg cgtatcggtgg gcattctgtgtg 120
50 ttggttttoga cggggttgaaa ccaaaccaga ctgccacga acgacggaaa tcccacaaagt 180
52 gggcatccct gtttggatcc gagtaccacac ccgggacctga aactccctgg caggcgggcg 240
54 aagcgtggca acaactggaa tttaagagca caattgaagt cgcaccaagt taggcaaacac 300
56 aatagccata acgttgagga gttcag atg gca cac agc tac gca gaa caa tta 353
57 Met Ala His Ser Tyr Ala Glu Gln Leu
58 1 5
60 att gac act ttg gaa get caa ggt gtg aag cga att tat ggt ttg gtg 401
61 Ile Asp Thr Leu Glu Ala Gln Gly Val Lys Arg Ile Tyr Gly Leu Val
62 10 15 20 25
64 ggt gac agc ctt aat ccg atc gtg gat gct gtc cgc caa tca gat att 449
65 Gly Asp Ser Leu Asn Pro Ile Val Asp Ala Val Arg Gln Ser Asp Ile
66 30 35 40
68 gag tgg gtg cac gtt cga aat gag gaa gcg gcg gcg ttt gca gcc ggt 497
69 Glu Trp Val His Val Arg Asn Glu Glu Ala Ala Ala Phe Ala Ala Gly

ENTERED

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/965,825

DATE: 11/07/2001

TIME: 14:41:53

Input Set : A:\es.txt

Output Set: N:\CRF3\11072001\I965825.raw

70	45	50	55	
72	gcg gaa tgc ttg atc act ggg gag ctg gca gta tgt gct gct tct tgt	545		
73	Ala Glu Ser Leu Ile Thr Gly Glu Leu Ala Val Cys Ala Ala Ser Cys			
74	60	65	70	
76	ggc cct gga aac aca cac ctg att cag ggt ctt tat gat tgc cat cga	593		
77	Gly Pro Gly Asn Thr His Leu Ile Gln Gly Leu Tyr Asp Ser His Arg			
78	75	80	85	
80	aat ggt ggc aag gtg ttg gcc atc gct agc cat att ccg agt gcc cag	641		
81	Asn Gly Ala Lys Val Leu Ala Ile Ala Ser His Ile Pro Ser Ala Gln			
82	90	95	100	105
84	att ggt tgc acg ttc ttc cag gaa acg cat ccg gag att ttg ttt aag	689		
85	Ile Gly Ser Thr Phe Phe Gln Glu Thr His Pro Glu Ile Leu Phe Lys			
86	110	115	120	
88	gaa tgc tct ggt tac tgc gag atg gtg aat ggt ggt gag cag ggt gaa	737		
89	Glu Cys Ser Gly Tyr Cys Glu Met Val Asn Gly Gly Glu Gln Gly Glu			
90	125	130	135	
92	cgc att ttg cat cac gcg att cag tcc acc atg gcg ggt aaa ggt gtg	785		
93	Arg Ile Leu His His Ala Ile Gln Ser Thr Met Ala Gly Lys Gly Val			
94	140	145	150	
96	tgc gtg gta gtg att cct ggt gat atc gct aag gaa gac gca ggt gac	833		
97	Ser Val Val Val Ile Pro Gly Asp Ile Ala Lys Glu Asp Ala Gly Asp			
98	155	160	165	
100	ggt act tat tcc aat tcc act att tct tct gcc act cct gtg gtg ttc	881		
101	Gly Thr Tyr Ser Asn Ser Thr Ile Ser Ser Gly Thr Pro Val Val Phe			
102	170	175	180	185
104	ccg gat cct act gag gct gca gcg ctg gtg gag gcg att aac aac gct	929		
105	Pro Asp Pro Thr Glu Ala Ala Ala Leu Val Glu Ala Ile Asn Asn Ala			
106	190	195	200	
108	aag tct gtc act ttg ttc tgc ggt gcg gcc gtg aag aat gct cgc gcg	977		
109	Lys Ser Val Thr Leu Phe Cys Gly Ala Gly Val Lys Asn Ala Arg Ala			
110	205	210	215	
112	cag gtg ttg gag ttg gcg gag aag att aaa tca ccg atc ggg gat gcg	1025		
113	Gln Val Leu Glu Leu Ala Glu Lys Ile Lys Ser Pro Ile Gly His Ala			
114	220	225	230	
116	ctg ggt ggt aag cag tac atc cag cat gag aat ccg ttt gag gtc gcc	1073		
117	Leu Gly Gly Lys Gln Tyr Ile Gln His Glu Asn Pro Phe Glu Val Gly			
118	235	240	245	
120	atg tct gcc ctg ctt ggt tac gcc gcc tgc gtg gat gcg tcc aat gag	1121		
121	Met Ser Gly Leu Leu Gly Tyr Gly Ala Cys Val Asp Ala Ser Asn Glu			
122	250	255	260	265
124	gcg gat ctg ctg att cta ttg ggt acg gat ttc cct tat tct gat ttc	1169		
125	Ala Asp Leu Leu Ile Leu Leu Gly Thr Asp Phe Pro Tyr Ser Asp Phe			
126	270	275	280	
128	cct cct aaa gac aac gtt gcc cag gtg gat atc aac ggt gcg cac att	1217		
129	Leu Pro Lys Asp Asn Val Ala Gln Val Asp Ile Asn Gly Ala His Ile			
130	285	290	295	
132	ggt cga cgt acc acg gtg aag tat ccg gtg acc ggt gat gtt gct gca	1265		
133	Gly Arg Arg Thr Thr Val Lys Tyr Pro Val Thr Gly Asp Val Ala Ala			
134	300	305	310	

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/965,825

DATE: 11/07/2001

TIME: 14:41:53

Input Set : A:\es.txt

Output Set: N:\CRF3\11072001\I965825.raw

136	aca	atc	gaa	aat	att	ttg	cct	cat	gtg	aag	gaa	aaa	aca	gat	cgt	tcg	1313
137	Thr	Ile	Glu	Asn	Ile	Leu	Pro	His	Val	Lys	Glu	Lys	Thr	Asp	Arg	Ser	
138			315			320						325					
140	ttc	ctt	gat	cgg	atg	ctc	aag	gca	cac	gag	cgt	aag	ttg	agc	tcg	gtg	1361
141	Phe	Leu	Asp	Arg	Met	Leu	Lys	Ala	His	Glu	Arg	Lys	Leu	Ser	Ser	Val	
142		330				335					340					345	
144	gta	gag	acg	tac	aca	cat	aac	gtc	gag	aag	cat	gtg	cct	att	cac	cct	1409
145	Val	Glu	Thr	Tyr	Thr	His	Asn	Val	Glu	Lys	His	Val	Pro	Ile	His	Pro	
146						350				355						360	
148	gaa	tac	gtt	gcc	tct	att	ttg	aac	gag	ctg	gcg	gat	aag	gat	gcg	gtg	1457
149	Glu	Tyr	Val	Ala	Ser	Ile	Leu	Asn	Glu	Leu	Ala	Asp	Lys	Asp	Ala	Val	
150						365				370						375	
152	ttt	act	gtg	gat	acc	ggc	atg	tgc	aat	gtg	tgg	cat	gcg	agg	tac	atc	1505
153	Phr	Thr	Val	Asp	Thr	Gly	Met	Cys	Asn	Val	Trp	His	Ala	Arg	Tyr	Ile	
154						380				385						390	
156	gag	aat	ccg	gag	gga	acg	cgc	gac	ttt	gtg	ggg	tca	ttc	cgc	cac	ggc	1553
157	Glu	Asn	Pro	Glu	Gly	Thr	Arg	Asp	Phe	Val	Gly	Ser	Phe	Arg	His	Gly	
158						395				400						405	
160	acg	atg	gct	aat	gcg	ttg	cct	cat	gcg	att	ggg	gcg	caa	agt	gtt	gat	1601
161	Thr	Met	Ala	Asn	Ala	Leu	Pro	His	Ala	Ile	Gly	Ala	Gln	Ser	Val	Asp	
162		410				415				420						425	
164	cga	aac	cgc	cag	gtg	atc	gcg	atg	tgt	ggc	gat	ggg	ggg	ttg	ggc	atg	1649
165	Arg	Asn	Arg	Gln	Val	Ile	Ala	Met	Cys	Gly	Asp	Gly	Gly	Leu	Gly	Met	
166						430				435						440	
168	ctg	ctg	ggg	gat	ctt	ctg	acc	gtt	aag	ctg	cac	caa	ctt	ccg	ctg	aag	1697
169	Leu	Leu	Gly	Glu	Leu	Leu	Thr	Val	Lys	Leu	His	Gln	Leu	Pro	Leu	Lys	
170						445				450						455	
172	gct	gtg	gtg	ttt	aac	aac	agt	tct	ttg	ggc	atg	gtg	aag	ttg	gag	atg	1745
173	Ala	Val	Val	Phe	Asn	Asn	Ser	Ser	Leu	Gly	Met	Val	Lys	Leu	Glu	Met	
174						460				465						470	
176	ctc	gtg	gag	gga	cag	cca	gaa	ttt	ggg	act	gac	cat	gag	gaa	gtg	aat	1793
177	Leu	Val	Glu	Gly	Gln	Pro	Glu	Phe	Gly	Thr	Asp	His	Glu	Glu	Val	Asn	
178						475				480						485	
180	ttc	gca	gag	att	gcg	gcg	gct	gcg	ggg	atc	aaa	tcg	gta	cgc	atc	acc	1841
181	Phe	Ala	Glu	Ile	Ala	Ala	Ala	Gly	Ile	Lys	Ser	Val	Arg	Ile	Thr		
182		490				495				500						505	
184	gat	ccg	aag	aaa	gtt	cgc	gag	cag	cta	gct	gag	gca	ttg	gca	tat	cct	1889
185	Asp	Pro	Lys	Lys	Val	Arg	Glu	Gln	Leu	Ala	Glu	Ala	Leu	Ala	Tyr	Pro	
186						510				515						520	
188	gga	cct	gta	ctg	atc	gat	atc	gtc	acg	gat	cct	aat	gcg	ctg	tcg	atc	1937
189	Gly	Pro	Val	Leu	Ile	Asp	Ile	Val	Thr	Asp	Pro	Asn	Ala	Leu	Ser	Ile	
190						525				530						535	
192	cca	cca	acc	atc	acg	tggt	gaa	cag	gtc	atg	gga	ttc	agc	aag	gcg	gcc	1985
193	Pro	Pro	Thr	Ile	Thr	Trp	Glu	Gln	Val	Met	Gly	Phe	Ser	Lys	Ala	Ala	
194						540				545						550	
196	acc	cga	acc	gtc	ttt	ggg	gga	gga	gta	gga	gcg	atg	atc	gat	ctg	gcc	2033
197	Thr	Arg	Thr	Val	Phe	Gly	Gly	Gly	Val	Gly	Ala	Met	Ile	Asp	Leu	Ala	
198						555				560						565	
200	cgt	tcg	aac	ata	agg	aat	att	cct	act	cca	tgatgattga	tacacctgct					2083

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/965,825

DATE: 11/07/2001

TIME: 14:41:53

Input Set : A:\es.txt

Output Set: N:\CRF3\11072001\I965825.raw

```

201 Arg Ser Asn Ile Arg Asn Ile Pro Thr Pro
202 570 575
204 gttctcattg accgcgagcg cttaactgcc aacatttcca ggatggcagc tcacgcgcgg 2143
206 gcccatgaga ttgccct 2160
209 <210> SEQ ID NO: 2
210 <211> LENGTH: 579
211 <212> TYPE: PRT
212 <213> ORGANISM: Corynebacterium glutamicum
214 <400> SEQUENCE: 2
216 Met Ala His Ser Tyr Ala Glu Gln Leu Ile Asp Thr Leu Glu Ala Gln
217 1 5 10 15
220 Gly Val Lys Arg Ile Tyr Gly Leu Val Gly Asp Ser Leu Asn Pro Ile
221 20 25 30
224 Val Asp Ala Val Arg Gln Ser Asp Ile Glu Trp Val His Val Arg Asn
225 35 40 45
228 Glu Glu Ala Ala Ala Phe Ala Ala Gly Ala Glu Ser Leu Ile Thr Gly
229 50 55 60
232 Glu Leu Ala Val Cys Ala Ala Ser Cys Gly Pro Gly Asn Thr His Leu
233 65 70 75 80
236 Ile Gln Gly Leu Tyr Asp Ser His Arg Asn Gly Ala Lys Val Leu Ala
237 85 90 95
240 Ile Ala Ser His Ile Pro Ser Ala Gln Ile Gly Ser Thr Phe Phe Gln
241 100 105 110
244 Glu Thr His Pro Glu Ile Leu Phe Lys Glu Cys Ser Gly Tyr Cys Glu
245 115 120 125
248 Met Val Asn Gly Gly Glu Gln Gly Glu Arg Ile Leu His His Ala Ile
249 130 135 140
252 Gln Ser Thr Met Ala Gly Lys Gly Val Ser Val Val Ile Pro Gly
253 145 150 155 160
256 Asp Ile Ala Lys Glu Asp Ala Gly Asp Gly Thr Tyr Ser Asn Ser Thr
257 165 170 175
260 Ile Ser Ser Gly Thr Pro Val Val Phe Pro Asp Pro Thr Glu Ala Ala
261 180 185 190
264 Ala Leu Val Glu Ala Ile Asn Asn Ala Lys Ser Val Thr Leu Phe Cys
265 195 200 205
268 Gly Ala Gly Val Lys Asn Ala Arg Ala Gln Val Leu Glu Leu Ala Glu
269 210 215 220
272 Lys Ile Lys Ser Pro Ile Gly His Ala Leu Gly Gly Lys Gln Tyr Ile
273 225 230 235 240
276 Gln His Glu Asn Pro Phe Glu Val Gly Met Ser Gly Leu Leu Gly Tyr
277 245 250 255
280 Gly Ala Cys Val Asp Ala Ser Asn Glu Ala Asp Leu Leu Ile Leu Leu
281 260 265 270
284 Gly Thr Asp Phe Pro Tyr Ser Asp Phe Leu Pro Lys Asp Asn Val Ala
285 275 280 285
288 Gln Val Asp Ile Asn Gly Ala His Ile Gly Arg Arg Thr Thr Val Lys
289 290 295 300
292 Tyr Pro Val Thr Gly Asp Val Ala Ala Thr Ile Glu Asn Ile Leu Pro
293 305 310 315 320

```

RAW SEQUENCE LISTING

PATENT APPLICATION: US/09/965,825

DATE: 11/07/2001

TIME: 14:41:53

Input Set : A:\es.txt

Output Set: N:\CRF3\11072001\I965825.raw

```

296 His Val Lys Glu Lys Thr Asp Arg Ser Phe Leu Asp Arg Met Leu Lys
297                               325           330           335
300 Ala His Glu Arg Lys Leu Ser Ser Val Val Glu Thr Tyr Thr His Asn
301                               340           345           350
304 Val Glu Lys His Val Pro Ile His Pro Glu Tyr Val Ala Ser Ile Leu
305                               355           360           365
308 Asn Glu Leu Ala Asp Lys Asp Ala Val Phe Thr Val Asp Thr Gly Met
309                               370           375           380
312 Cys Asn Val Trp His Ala Arg Tyr Ile Glu Asn Pro Glu Gly Thr Arg
313 385                               390           395           400
316 Asp Phe Val Gly Ser Phe Arg His Gly Thr Met Ala Asn Ala Leu Pro
317                               405           410           415
320 His Ala Ile Gly Ala Gln Ser Val Asp Arg Asn Arg Gln Val Ile Ala
321                               420           425           430
324 Met Cys Gly Asp Gly Gly Leu Gly Met Leu Leu Gly Glu Leu Leu Thr
325                               435           440           445
328 Val Lys Leu His Gln Leu Pro Leu Lys Ala Val Val Phe Asn Asn Ser
329                               450           455           460
332 Ser Leu Gly Met Val Lys Leu Glu Met Leu Val Glu Gly Gln Pro Glu
333 465                               470           475           480
336 Phe Gly Thr Asp His Glu Glu Val Asn Phe Ala Glu Ile Ala Ala Ala
337                               485           490           495
340 Ala Gly Ile Lys Ser Val Arg Ile Thr Asp Pro Lys Lys Val Arg Glu
341                               500           505           510
344 Gln Leu Ala Glu Ala Leu Ala Tyr Pro Gly Pro Val Leu Ile Asp Ile
345                               515           520           525
348 Val Thr Asp Pro Asn Ala Leu Ser Ile Pro Pro Thr Ile Thr Trp Glu
349                               530           535           540
352 Gln Val Met Gly Phe Ser Lys Ala Ala Thr Arg Thr Val Phe Gly Gly
353 545                               550           555           560
356 Gly Val Gly Ala Met Ile Asp Leu Ala Arg Ser Asn Ile Arg Asn Ile
357                               565           570           575
360 Pro Thr Pro
364 <210> SEQ ID NO: 3
365 <211> LENGTH: 875
366 <212> TYPE: DNA
367 <213> ORGANISM: Corynebacterium glutamicum
369 <400> SEQUENCE: 3
370 tgcgagatgg tgaatgggtg tgagcagggt gaacgcattt tgcatacgc gattcagtc 60
372 accatggcgg gtaaagggtg gtcggtggta gtgattcctg gtgatatcgc taaggaagac 120
374 gcaggtgacg gtacttattc caattccact atttctctg gcactcctgt ggtgttcccg 180
376 gatctcactg aggtgcagc gctggtggag gcgattaaca acgctaagtc tgtcaatttg 240
378 ttctgcggtg cyggcgtaaa gaatgctcgc gcgcagggtg tggagttggc ggagaagatt 300
380 aaatacacga tcgggcacgc gctgggtggt aagcagtaca tccagcatga gaatcgttt 360
382 gaggtcggca tctctggcct ctctggttac ggcgcctcgc tggatgcgtc caatgaggcg 420
384 gatctgtgta tctattggg tacggatttc ccttattctg atttccctcc taagacaac 480
386 gttgccagag tggatatcaa cggtcgcgac attgctcag gtaccacggt gaagtatccg 540
388 gtgaccgggt atgttgctgc aacaatcgaa aatatattgc ctcatgtgaa ggaaaaaaca 600
390 gatcgttctt tcttgatcg gatgctcaa gcacacgagc gtaagttaga ctcggtggta 660

```

VERIFICATION SUMMARY

PATENT APPLICATION: US/09/965,825

DATE: 11/07/2001

TIME: 14:41:54

Input Set : A:\es.txt

Output Set: N:\CRF3\11072001\I965825.raw

L:12 M:270 C: Current Application Number differs, Replaced Current Application No

L:12 M:271 C: Current Filing Date differs, Replaced Current Filing Date